

Application No. 10/696,653
Amendment Dated January 25, 2007
Reply to Office Action of November 2, 2006

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Cancelled)
2. (Currently Amended) The method for optimizing electromagnetic energy of Claim [[1]] 22, ~~the further step of~~ determining a plurality of frequency distributions in accordance with said plurality of differing selected frequencies.
3. (Currently Amended) The method for optimizing electromagnetic energy of Claim 2, ~~the further step of~~ determining a plurality of image quality metrics in accordance with said plurality of frequency distributions.
4. (Currently Amended) The method for optimizing electromagnetic energy of Claim 3, ~~the further step of~~ optimizing an image of said plurality of images.
5. (Currently Amended) The method for optimizing electromagnetic energy of Claim [[1]] 22, wherein said predetermined image criterion is selected in accordance with ~~the a~~ light absorption property properties of a selected tissue.
6. (Previously Presented) The method for optimizing electromagnetic energy of Claim 5, wherein said selected tissue comprises tumor tissue.
7. (Previously Presented) The method for optimizing electromagnetic energy of Claim 5, wherein said selected tissue comprises lesion tissue.

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8. (Previously Presented) The method for optimizing electromagnetic energy of Claim 5, wherein said selected tissue comprises blood tissue.

9. (Currently Amended) The method for optimizing electromagnetic energy of Claim 5, wherein said ~~predetermined~~ image criterion is selected in accordance with ~~the a~~ light absorption property properties of a tissue pathology.

10. (Currently Amended) The method for optimizing electromagnetic energy of Claim 5, further comprising ~~the further step of~~ locating said selected tissue in an eye of a patient in accordance with said determined frequency.

11. (Currently Amended) The method for optimizing electromagnetic energy of Claim 5 further comprising ~~the further steps of~~:

- (a) applying a further light beam of said determined frequency to [[a]] said selected tissue; and
- (b) performing surgery upon said selected tissue in accordance with said further light beam.

12. (Currently Amended) The method for optimizing electromagnetic energy of Claim 5, wherein said eye has a selected tissue feature further comprising ~~the further step of~~ determining changes in said selected tissue feature in accordance with said determined ~~selected~~ light frequency.

13. (Currently Amended) The method for optimizing electromagnetic energy of Claim 4, further comprising ~~the further step of~~ applying said plurality of reflected light beams to a spatial

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light modulator and an image sensor to provide said plurality of signals representative of said reflected light beams.

14. (Currently Amended) The method for optimizing electromagnetic energy of Claim 13, further comprising ~~the step of~~ determining said plurality of image quality metrics in accordance with said signals representative of said reflected light as:

$$J = \iint F \{ \exp[i\gamma l(x, y)] \}^4 dx dy$$

where F is a Fourier transform and $\{\}$ γ is a parameter dependent upon a dynamic range of said reflected light beams.

15. (Currently Amended) The method for optimizing electromagnetic energy clarifying ~~an optical/digital image of an object of~~ Claim [[1]] 22, further comprising ~~the further steps of~~:

- (a) applying to said object a superposition light beam and reflecting said superposition light beam from said object to provide a reflected superposition light beam;
- (b) — providing a superposition image in accordance with said reflected superposition light beam; and
- (c) — superimposing said selected image and said superposition image to provide a composite image.

16. (Currently Amended) The method for optimizing electromagnetic energy clarifying ~~an optical/digital image of an object of~~ Claim 15, further comprising ~~the further step of~~ performing said procedure in accordance with said composite image.

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17. (Currently Amended) The method for optimizing electromagnetic energy clarifying an optical/digital image of an object of Claim 16, further comprising the further step of applying said selected image and said superposition image to a superposition screen in order to provide said composite image.

18. (Currently Amended) The method for optimizing electromagnetic energy clarifying an optical/digital image of an object of Claim 17, wherein said object has a selected feature further comprising the further step of optimizing at least one of said selected image and said superposition image to emphasize a visualization of said selected feature.

19. (Currently Amended) The method for optimizing electromagnetic energy clarifying an optical/digital image of an object of Claim 18, wherein said object is an eye further comprising the further step of de-emphasizing a visualization of blood.

20. (Currently Amended) The method for optimizing electromagnetic energy clarifying an optical/digital image of an object of Claim 18, further comprising the further step of adjusting an amount of emphasizing of said visualization during a performance of said procedure.

21. (Currently Amended) The method for optimizing electromagnetic energy clarifying an optical/digital image of an object of Claim 20, further comprising the further step of adjusting an amount of emphasizing of said selected feature by adjusting the relative contributions of said selected image and said superposition image to said composite image.

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Please add the following new claims 22-30.

22. (New) A method for optimizing electromagnetic energy in a system for processing an image of an object for performing a procedure on an object, comprising:

selecting a plurality of differing frequencies of incoherent light to provide a plurality of differing selected frequencies;

individually applying differing light beams of a plurality of differing light beams to an object wherein each differing light beam has a respective selected frequency of said plurality of selected frequencies to provide a plurality of differing applied light beams, each differing applied light beam having its respective selected frequency;

reflecting said plurality of differing applied light beams from said object to provide a plurality of differing reflected light beams, each differing reflected light beam having its respective selected frequency;

providing a corresponding plurality of electrical signals representative of said reflected light beams of said plurality of differing reflected light beams;

determining a corresponding plurality of image quality metrics in accordance with said plurality of electrical signals;

determining a corresponding plurality of images in accordance with said plurality of image quality metrics;

determining an image of said plurality of images in accordance with an image criterion to provide a determined image;

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determining said respective selected frequency of said plurality of selected frequencies in accordance with said determined image to provide a determined frequency; and

performing said procedure on an object in accordance with said determined frequency.

23. (New) A method for optimizing electromagnetic energy in a system for processing an image of an object for performing a procedure on an object, comprising the steps of:

applying to an object a plurality of light beams formed of incoherent light at a plurality of differing frequencies and reflecting said plurality of applied incoherent light beams from said object to provide a plurality of reflected light beams;

providing a corresponding plurality of electrical signals representative of the reflected light beams of said plurality of reflected light beams;

determining a corresponding plurality of image quality metrics in accordance with said plurality of electrical signals;

determining a corresponding plurality of images in accordance with said plurality of image quality metrics;

selecting an image of said plurality of images in accordance with a predetermined image criterion to provide a selected image;

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determining a frequency of said plurality of differing frequencies in accordance with said selected image to provide a determined frequency; and performing said procedure on an object in accordance with said determined frequency wherein said image criterion is selected in accordance with a light interactive property of a selected tissue.

24. (New) The method for optimizing an electromagnetic energy of claim 23, wherein said image criterion is selected in accordance with a light absorption property of said selected tissue.

25. (New) The method for optimizing an electromagnetic energy of claim 23, wherein said selected tissue comprises tumor tissue.

26. (New) The method for optimizing an electromagnetic energy of claim 23, further comprising locating said selected tissue in an eye of a patient in accordance with said determined frequency.

27. (New) A method for optimizing electromagnetic energy in a system for processing an image of an object for performing a procedure on an object, comprising the steps of:
applying to an object a plurality of light beams formed of incoherent light at a plurality of differing frequencies and reflecting said plurality of applied incoherent light beams from said object to provide a plurality of reflected light beams;

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providing a corresponding plurality of electrical signals representative of the reflected light beams of said plurality of reflected light beams;

determining a corresponding plurality of image quality metrics in accordance with said plurality of electrical signals;

determining a corresponding plurality of images in accordance with said plurality of image quality metrics;

selecting an image of said plurality of images in accordance with a predetermined image criterion to provide a selected image;

determining a frequency of said plurality of differing frequencies in accordance with said selected image to provide a determined frequency;

performing said procedure on an object in accordance with said determined frequency;

determining a plurality of frequency distributions in accordance with said plurality of selected frequencies;

determining a plurality of image quality metrics in accordance with said plurality of frequency distributions;

optimizing an image of said plurality of images; and

applying said plurality of reflective light beams to a spacial light modulator and an image sensor to provide said plurality of signals representative of said reflective light beams.

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28. (New) The method for optimizing electromagnetic energy of claim 27, further comprising determining said plurality of image quality metrics in accordance with said signal reflective of said reflective light as:

$$J = \int |F\{\exp[i\gamma I(x,y)]\}|^4 dx dy$$

where F is a Fourier transformed and γ is a parameter dependent upon a dynamic range of said reflected light beams.

29. (New) A method for optimizing electromagnetic energy in a system for processing an image of an object for performing a procedure on an object, comprising the steps of:

applying to an object a plurality of light beams formed of incoherent light at a plurality of differing frequencies and reflecting said plurality of applied incoherent light beams from said object to provide a plurality of reflected light beams;

providing a corresponding plurality of electrical signals representative of the reflected light beams of said plurality of reflected light beams;

determining a corresponding plurality of image quality metrics in accordance with said plurality of electrical signals;

determining a corresponding plurality of images in accordance with said plurality of image quality metrics;

selecting an image of said plurality of images in accordance with a predetermined image criterion to provide a selected image;

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determining a frequency of said plurality of differing frequencies in accordance with said selected image to provide a determined frequency; performing said procedure on an object in accordance with said determined frequency;

applying to said object a superposition light beam and reflecting said superposition light beam from said object to provide a reflected superposition light beam;

providing a superposition image in accordance with said reflected superposition light beam; and

superimposing said selected image and said superposition image to provide a composite image.

30. (New) The method for optimizing electromagnetic energy of claim 29, comprising performing said procedure in accordance with said composite image.